

**FIRE PUMP SHOP DRAWINGS
1999 NFPA 20 and 2002 NFPA 13**

Listed items require fire pump system shop drawing revisions or manufacturer product cut sheets verifying listing by a nationally recognized testing laboratory. Answers in letter form **are not** acceptable. **Starting construction before plans approval may be considered as just cause, by the State, to issue a stop work order. [Rule 0780-2-3-.03(2)]**

I. Submittal Requirements

1. Provide the following: Two sets of shop drawings with the responsible managing employee's signature and number for the fire pump assembly (i.e., pump, motor, controlling equipment, jockey pump, valves, etc.), one copy of hydraulic calculations for the water demand design for the building (sprinkler and/or standpipe), one copy of manufacturer's cut sheets verifying fire protection listings for fire pump assembly, controllers, underground and above-ground piping, fittings, valves, devices, hangers, etc. [NFPA 20 1-4]
2. Provide calculations and a graph sheet showing the fire pump curve, the public water curve, and the combined pump/water supply curve. [NFPA 13 Chapter 14] Plot the sprinkler and/or standpipe water demand design on graph to prove that water supply meets water demand for the building.

II. Above-Ground

1. The fire department connection must be on the discharge side of the fire pump. [NFPA 13 6.8]
2. Provide a check valve on the discharge side of the fire pump and jockey pump. [NFPA 20 2-10.4 and 2-19.2] Provide an indicating gate or butterfly valve on the system side of the pump discharge check valve of the fire pump and jockey pump. [NFPA 20 2-10.5 and NFPA 20 2-19.3]
3. See NFPA 20 Table 2-20 for sizing of the suction and discharge piping, relief valves, meters, etc.
4. The fire pump suction piping size must be sufficient to operate at 150 percent of rated capacity with zero psi minimum gauge pressure unless the supply is a suction tank with its base at or above the pump. [NFPA 20 2-9.3]
5. Where located in the suction pipe of the fire pump, check valves and backflow preventers must be located a minimum of 10 pipe diameters from the pump. [NFPA 20 2-21.3]
6. The test header is to have _____ hose valves of _____ inch sizing per NFPA 20 Table 2-20. The test header piping is to be _____ inches.
7. For electric motor driven pumps, provide a circulation relief valve between the pump and check valve and show discharge to a drain. [NFPA 20 2-6.1] Identify termination of the drain.
8. Provide a pressure gauge per NFPA 20 2-5. The suction gauge must be a compound type.

9. The jockey and fire pump controllers must have separate sensing lines. [NFPA 20 7-5.2] The pressure sensing line must be located between the discharge check valve and control valve. [NFPA 20 7-5.2.1(b)] See figures A-7-5.2.1(a) and (b).
10. Provide a check valve and indicating gate or butterfly valve at the discharge of the jockey pump. [NFPA 20 A-2-19.3]
11. The pump shutoff (churn) pressure plus the maximum static suction pressure, adjusted for evaluation must not exceed the pressure for which the system components are used [NFPA 20 2-2.4] Pressure relief valves should not be used to meet this requirement. [NFPA 20 A-2-2.4]
12. The complete fire pump unit shall be field acceptance tested for proper performance in accordance with NFPA 20 Chapter 1. [NFPA 20 1-6.2, 2-23, and 11-2] This is generally a stipulation on approval. Notify our office of the time and place of the acceptance test. [NFPA 20 11-2.2]
13. Requirements for diesel engine drive see NFPA 20 Chapter 8. Show on the plans and specifications.
 - A. Applications: NFPA 20 8-1
 - B. Engines: NFPA 20 8-2
 - C. Controllers: NFPA 20 Chapter 9
 - D. Instrumentation and Control: NFPA 20 8-2.4
 - E. Number and Capacity of Batteries: NFPA 20 8-2.5.2.1
 - F. Fuel Supply and Arrangement: NFPA 20 8-4
 - G. Engine Exhaust: NFPA 20 8-5
 - H. Pump Room Drain: NFPA 20 8-3.1; Ventilation: NFPA 20 8-3.2; Controller and Alarm: NFPA 20 9-1, 9-2, and 7-4.7
 - I. Relief Valve: NFPA 20 2-13

III. Electrical

1. All controllers must be located close to the motor with access for servicing. [NFPA 20 7-2.1]
2. The emergency power transfer switch must be listed for fire pump service. [NFPA 20 7-8.3.1 and 7-8.2.3]
3. Provide a listed audible or visual alarm panel in a constantly attended location tied into the fire pump controller identifying conditions when (1) the controller has operated into a motor running condition, (2) loss of power on the line side of the motor starter has occurred, and (3) phase reversal on line side of the motor has occurred. [NFPA 20 7-4.7 and 7-4.8]
4. All controllers and transfer switches must be specifically listed for electric motor driven fire pump service. [NFPA 20 7-1.2.1]